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Emergent Team Roles in Organizational Meetings: Identifying Communication Patterns via Cluster Analysis

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Previous team role taxonomies have largely relied on self-report data, have focused on functional roles and have described individual predispositions or personality traits. Instead, this study takes a communicative approach and proposes that team roles are produced, shaped and sustained in communicative behaviors. To identify team roles communicatively, 59 regular organizational meetings were videotaped and analyzed. Cluster analysis revealed five emergent roles: the solution seeker, the problem analyst, the procedural facilitator, the complainer, and the indifferent. In terms of meeting outcomes, solution seekers were beneficial to idea longevity, whereas complainers were harmful for meeting satisfaction and idea longevity. Future research directions and managerial implications are highlighted.

Keywords: *Cluster Analysis; Interaction Analysis; Meeting Communication; Team Roles*

In the accomplishment of team outcomes, members hold meetings to plan, to debate, and to decide on future endeavors. In the course of these meetings, members perform a variety of roles, some of which are necessary to resolve the needs of the group and to

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successfully achieve the team's purpose. These roles may be formally appointed or informally created; either way, the weight and power associated with these roles is based to a large extent on the interaction between team members. Previous research on team roles has relied on personality-oriented approaches to determine which member should perform which role. However, since interaction is how roles are created, negotiated and performed among team members, the present study takes a communicative approach and examines how team roles are constructed and identified through interaction, and how these behaviorally based roles relate to team outcomes.

In consideration of the various ways roles are created, Belbin identified two distinct types of roles: functional roles and team roles. *Functional roles* encompass the way an individual meets his or her job demands by means of his or her knowledge and skills (Belbin, 2010; Stempfle, Hübner, & Badke-Schaub, 2001). For example, an individual may be formally assigned to a team for the specific purpose of taking notes, based on his or her known skill set. *Team roles* on the other hand emerge through interaction patterns. The emergence of team roles through interaction plays to the strength of the communication perspective.

A communication perspective focuses on messages and problematizes rather than assumes communication (Burleson, 1992). Thus, when determining member roles in teams, a communicative approach investigates team member message distributions and patterns as the foundation of their respective roles. In other words, a communicative approach is consistent with Forsyth's definition of team roles as "coherent sets of behaviors expected of people in specific positions within a group or social setting" (Forsyth, 2009, p. 149). Beebe and Masterson (2003) state that "[a]s you interact with others, they form impressions of you and your abilities. As they reward you for your actions in the group, you learn what abilities and behaviors they will reinforce" (p. 74). The assignment of a functional role may influence team roles, but role differentiation, or the development of roles, occurs primarily through interaction with team members (Hare, 1994; Salazar, 1996).

To date, empirical evidence of these interaction-based roles is sparse. Moreover, past researchers have largely focused on taxonomies of helpful team roles (e.g., Belbin, 1981, 2010). Although early work by Benne and Sheats (1948) and Bales (1970) posited the influence of negative interaction roles on team behavior and outcomes, our understanding of the different types of *behaviors* associated with various roles, as well as the influence of team roles on meetings and meeting outcomes, needs more rigorous investigation. Methodological advances in team interaction analysis (e.g., Kauffeld & Lehmann-Willenbrock, 2012) can provide a more sophisticated analysis of team roles that emerge through behavioral interaction, as well as examine their influence on the outcomes of team interaction. Since roles emerge and are sustained through interaction (Hare, 1994; Salazar, 1996), it seems important to move away from self-report measures towards observation and analysis of team members' communication.

Using a communicative approach, we aim to identify meeting roles in terms of distinguishable interaction patterns of team members, assuming that team members' roles are produced, shaped and sustained in group interactions (Beebe & Masterson,

2003; Poole, Seibold, & McPhee, 1985). As such, our investigation offers the following contributions. First, we apply a communicative approach to the study of team roles in order to bridge the current gap between team role taxonomies and team process research. Second, we use a coding scheme that has improved upon the nuance of team interaction dynamics (Kauffeld & Lehmann-Willenbrock, 2012). Importantly, behavioral patterns for positive and negative team roles can be thoroughly investigated through the act4teams coding scheme. Third, in contrast to past studies on team roles that have relied heavily on artificial groups (e.g., Summers, Humphrey, & Ferris, 2012), we investigate real teams in their natural organizational setting to improve external validity. Finally, we connect emergent team roles to specific outcomes that are communicative in nature, as opposed to solely considering psychosocial outcomes.

Team Role Taxonomies

Previous research on team roles has led to several role taxonomies. One of the more widely known and applied, Belbin's team role model (Belbin, 1981, 2010), contains nine team roles: resource-investigator, team worker, company worker (or implementer), completer-finisher, monitor-evaluator, plant, chairman (or cooperator), shaper, and specialist. Belbin (2010) maintains that team roles become expressed in terms of (observable) behaviors and thinking styles. Individual team members have a certain predisposition to behave in a team according to these roles but are not necessarily predestined to any given role. Belbin further assumes that a successful team requires a broad range and a balance of team roles. The effectiveness of a team then depends on the ability of its members to assess themselves and to adapt to the team. There have been efforts to validate Belbin's team role inventory (Fisher, Hunter, & Macrosson, 2001). Moreover, the notion that team role balance is beneficial for team performance has received some empirical support (Senior, 1997).

Another well-known team role taxonomy concerns the team management system (TMS), which was originally developed by Margerison and McCann (1990). Inspired by Jung's (1971) psychological types, the TMS identifies nine key work functions, which the authors describe as independent from any work context: advising, innovating, promoting, developing, organizing, producing, inspecting, maintaining, and linking (McCann & Margerison, 1989). By associating these work functions with personality factors based on Jung's psychological types, the authors developed the "Team Management Index" (TMI) to assess individual preferences in relating to others, gathering data, making decisions, and organizing.

Moreover, previous research has typically subdivided team roles into task and socioemotional roles. Task roles include roles related to goal achievement whereas socioemotional roles focus on meeting the emotional needs of the participants (Forsyth, 2009). Benne and Sheats (1948) proposed individual roles as a third category. While task and socioemotional roles have a certain task-related or team-building function, individual roles are typically dysfunctional. They are based on the fulfillment of individual members' needs rather than group needs. Some individual roles, such as

the "aggressor," who attacks other group members and their opinions, or the "blocker," who has a negative attitude and objects without reason, may hinder the group (cf. Benne & Sheats, 1948).

A Communicative Approach to Team Role Creation

Although early work by Benne and Sheats (1948) and Bales (1970) posited the influence of dysfunctional interaction roles on team behavior and outcomes, our understanding of the different types of *behaviors* associated with various roles, as well as the influence of team roles on team meeting outcomes, remains limited. In applying a communication lens and taking a communicative approach to understand the ways in which team roles emerge, we depart from most of the existing literature that suggests that these roles are a byproduct of individual preferences or personality types. By focusing on the ways in which team roles become expressed in terms of observable behavior during team interactions, we hope to gain insights into the dynamics of role emergence in organizational teams.

To explore the idea that team roles can be identified as observable communicative patterns during team interactions, we focus our investigation on team meetings as a particular interaction context. Meetings are a frequent organizational activity, with employees spending 6 hours per week, on average, in meetings (e.g., Cohen, Rogelberg, Allen, & Luong, 2011; Rogelberg, Leach, Warr, & Burnfield, 2006). Team meetings in particular have become an integral part of employees' work lives (e.g., Lehmann-Willenbrock, Allen, & Kauffeld, 2013). Team meetings are a key venue for observing team problem-solving processes (e.g., Kauffeld & Lehmann-Willenbrock, 2012), sensemaking activities (Baran, Shanock, Rogelberg, & Scott, 2012), and social dynamics in general (Meinecke & Lehmann-Willenbrock, 2015). Moreover, team meetings are communicatively created (Beck, 2008), deeming them an appropriate context for examining how team roles are constructed through team communication.

We assume that some of the team roles that emerge through meeting communication will be similar to roles described in the literature on team roles but also expect that new roles may emerge. Previous research on team roles has relied on participants' self-report commentaries or personality tests to predict team role types, rather than actually observing behavior (e.g., Belbin, 1981, 2010; McCann & Margerison, 1989; Spencer & Pruss, 1992). In addition, the occurrence of potentially dysfunctional team roles have been generally neglected in these taxonomies, with researchers preferring to focus on the roles a team *ought* to have as opposed to the what roles *actually* exist. Research suggests that individual team members can behave in negative and dysfunctional ways (e.g., the "bad apple phenomenon"; Felps, Mitchell, & Byington, 2006), and considering such roles and behaviors and their influence on team functioning is imperative. We are interested in exploring the complete range of emergent roles possible. Hence, we posit our first research question:

RQ1: Which team roles emerge as observable communicative patterns during team interaction processes?

Second, if team roles emerge as communicative patterns, we would expect the emergence of certain roles to have an impact on team members' affective reactions to the interaction process. Theorists have disagreed about what is the best composition of team roles for maximum success (e.g., Belbin, 1981, 2010). Prichard and Stanton (1999) compared the performance of teams that included a variety of roles with teams consisting of only one role (shapers) in a management game. In support of the role-balance hypothesis, teams containing a variety of roles performed better. In related research on roles and group outcomes, Stewart, Fulmer, and Barrick (2005) found that the mean level of social roles corresponded to the group outcome of social cohesion; however, no link was found between task role behavior and team task performance.

Previous research on team interaction during meetings suggests linkages between behavioral patterns occurring in meetings and team members' satisfaction with the meeting process (Kauffeld & Lehmann-Willenbrock, 2012; Lehmann-Willenbrock et al., 2013). Moreover, emergent team roles could affect not only team members' satisfaction with their meetings but also the meeting outcome. Important goals of meetings in organizations include information sharing, idea generation, and decision making (e.g., Kauffeld & Lehmann-Wilenbrock, 2012; Rogelberg, Allen, Shanock, Scott, & Shuffler, 2010; Tracy & Dimock, 2004). Hence, in terms of meeting outcomes, we are particularly interested in the extent to which ideas or solutions are developed in the meeting.

Taken together, findings from previous research on the link between roles and outcomes suggest that emergent communicative roles in team meetings might impact not only team members' satisfaction with the team meeting interaction processes but also the longevity of solutions developed in team meetings. Hence, we posit the following two research questions:

RQ2: To what extent does the presence of specific team roles affect participants' satisfaction with the team meeting process?

RQ3: To what extent does the presence of specific team roles affect the longevity of ideas produced in team meetings?

Method

Sample

Fifty-nine teams from 19 organizations participated in this study. A minimum of two and a maximum of four teams from each company were included in the sample. Participating teams were industrial or administrative teams from the automotive supply industry (27 teams), the metal and electrical industry (16 teams), the packaging industry (six teams), as well as the public utility (six teams) and consumer goods industry (four teams).

Five to seven team members, a favorable number for problem-solving groups (e.g., Hackman & Vidmar, 1970), participated in each meeting. When teams were larger, the management was asked to select seven members for the meeting (in cooperation

with the respective team members).[1] There were no formal status differences within the team members; however, the teams had been working together for a considerable amount of time and other emergent structures were possibly present. The majority of the 357 participants were male (90.5%), which is representative of the gender distribution in planning and production. The majority of the participants were between 31 and 40 years old (42.6%); 22.4% were between 41 and 50, 21.3% were between 21 and 30, 11.5% were older than 51 years, and 2.2% of the team members did not state their age. The majority had completed an apprenticeship (81.0%); 10.9% held a university degree; 0.3% had other training, and 4.8% did not have any vocational training (3.1% missing).

Procedure

Data were collected from these teams as they discussed a specific work-related topic of their choice (e.g., "How can the quality of our products be improved?") during a regular team meeting. In the participating organizations, team meetings are held once or twice a month without the presence of a supervisor. The teams agreed on the importance of working on the specific topic selected, thus ensuring that both the topic and the meeting outcome were relevant for the participants' daily work. The team meetings took up to 1.5 hours. Participants were asked to ignore the setting and to discuss their topics as they would under regular circumstances. In a survey after the meeting, the teams described their interaction as typical of their regular meetings despite the videotaping. Furthermore, the teams stated that the assigned 1.5-hour period provided enough time for generating possible solutions and planning first implementation steps. Following the meetings, each team was offered a workshop for team development. This provided a means to reciprocate for their willingness to participate in our study. Moreover, the workshops offered the opportunity to follow up on ideas generated during the meetings. The content of the workshop focused on problem-solving methods and their use in future work (e.g., the use of action plans; see Table 1 for an example). Teams knew that they would be offered these workshops prior to agreeing to participate in this research project. We communicated to them that the workshops were aimed at team development in general (rather than improving meeting processes in particular). All participation was voluntary and participants were guaranteed anonymity of their individual data at all times.

Measures

Meeting behaviors

The assumption was that team roles would manifest themselves in the participants' individual utterances. We videotaped the verbal behaviors in the 59 meetings. Verbal behaviors were transcribed and then subdivided into units. A unit was defined as a communicative act that in its context can be understood by another member as equivalent to a single simple sentence (Bales, 1950). Each unit was coded with one of the 44 observation categories of the act4teams coding scheme for meetings (e.g., Kauffeld & Lehmann-Willenbrock, 2012; Lehmann-

Table 1 Sample Action Plan Topic: "Quality Improvement"

Solutions	What is to be done?	Who?	When?
Include works council in training	Talk to works council (Mr. Y) to clarify training tasks (content)	Mr. S	Week 7
Revise instruction program, design corrective training concept	Organize meeting with Mrs. X, a maintenance employee, Mr. S., one or two blue-collar workers, and possibly works council and Mrs. A	Mrs. X	Week 6
Obtain ideas from other production units	Inquire at Companies O and QC	Mrs. X	Week 6
	Inquire at Company V	Mrs. T	Week 6
Mrs. X responsible for coordination	Inform production unit in employee meeting	Mrs. X	Week 5
Sensitize maintenance staff, point out the situation, etc.	Give information to maintenance staff	Mr. S	Week 5

Willenbrock, Meyers, Kauffeld, Neininger, & Henschel, 2011). As depicted in Table 2, this coding scheme identifies four types of team meeting communication: problem-focused, procedural, socioemotional, and action-oriented meeting behaviors. *Problem-focused* behaviors are directly related to understanding the problem or issue, coming up with ideas for appropriate solutions, and evaluating those solutions. *Procedural* behaviors are aimed at structuring and organizing the meeting. They can be either positive (e.g., making procedural suggestions or visualizing) or negative (losing the train of thought). *Socioemotional* behaviors capture the relational interaction that occurs in teams and, again, can be either positive or negative. Positive socioemotional behaviors include active listening or providing feedback. Negative socioemotional behaviors include backbiting or self-promotion. Finally, *action-oriented* behaviors represent a teams' willingness to take action to improve their work beyond the meeting context. These statements can be either proactive (such as expressing positivity) or counteractive (e.g., complaining). For a detailed description of the development and validation of these coding categories, see Kauffeld and Lehmann-Willenbrock (2012).

Coding was carried out by two trained raters. To establish interrater reliability, six meetings were selected at random and coded by both raters. The obtained value of .90 for Cohen's Kappa, computed across all six meetings, is considered strong interrater reliability (Cohen, 1960). The internal consistencies of the act4teams aspects were also considered sufficient ($\alpha > .60$).

In order to determine team roles by means of cluster analysis, the number of units coded in each category was identified. These were then added up within the act four teams aspects (printed in bold in Table 2, e.g., "differentiating a problem"). For procedural, socioemotional, and action-oriented statements, separate sums were computed for positive and negative statements. For example, the statement "Let's write down this solution" was categorized as a procedural suggestion under positive structuring statements, and all

Table 2 Meeting Behaviors Coding Scheme (Kauffeld & Lehmann-Willenbrock, 2012)

Problem-focused statements	Procedural statements	Socioemotional statements	Action-oriented statements
Differentiating a problem	**Positive procedural statements**	**Positive socioemotional statements**	**Proactive statements**
Problem	*Goal orientation*	*Encouraging participation*	*Expressing positivity*
identifying a (partial) problem	pointing out or leading back to the topic	e.g., addressing quiet participants	signalizing interest in ideas, options, etc.
Describing a problem	*Clarifying*	*Providing support*	*Personal responsibility*
illustrating a problem	ensuring that contributions are to the point	agreeing to suggestions, ideas, etc.	taking on responsibility
Cross-linking a problem	*Procedural suggestion*	*Active listening*	*Action planning*
Connections with a problem	suggestions for further procedure	signalizing interest ("hmm", "yes")	agreeing upon tasks to be carried out
e.g., naming causes and effects	*Procedural question*	*Reasoned disagreement*	**Counteractive statements**
Differentiating a solution	questions about further procedure	contradiction based on facts	*No interest in change*
Defining the objective	*Prioritizing*	*Giving feedback*	e.g., denial of optimization opportunities
vision, description of requirements	stressing main topics	e.g., whether something is new or already known	*Complaining*
Solution	*Time management*	*Lightening the atmosphere*	emphasizing the negative status quo, pessimism
identifying a (partial) solution	reference to (remaining) time	e.g., jokes	*Empty talk*
Describing a solution	*Task distribution*	*Separating opinions from facts*	e.g., irrelevant proverbs, truism
illustrating a solution	delegating tasks during the discussion	marking one's own opinion as such	*Seeking someone to blame*
Cross-linking a solution	*Visualizing*	*Expressing feelings*	personalizing problems
Problem with a solution	using flip chart and similar tools	mentioning feelings	
objection to a solution	*Weighing costs/benefits*	*Offering praise*	
Connections with a solution	economical thinking	e.g., positive remarks about other people	
e.g., naming advantages of solutions			

Statements about the organization	*Summarizing*	**Negative socio-emotional statements**	*Denying responsibility*
Organizational knowledge	summarizing results	*Criticizing/backbiting*	pointing out hierarchies, pushing
knowledge about organization and processes	**Negative procedural statements**	disparaging comments about others	the task
Knowledge management	*Losing the train of thought in details and examples*	*Interrupting*	onto someone else
Knowing who	examples irrelevant to the goal, monologues	cutting someone off while speaking	*Terminating the discussion*
reference to specialists		*Side conversations*	ending or trying to end the discussion early
Question		simultaneous talk on the side	
question about opinions, content, experience		*Self-promotion*	
		pointing out work experience, tenure, etc.	

Note. The four facets of meeting interaction are found in the four columns. Aspects (e.g., Differentiating a Problem) are printed in bold. Observation categories for coding individual meeting behaviors in bold italics (e.g., Problem).

positive statements were then added up to determine the frequency of positive procedural communicative behavior.

Since the length of the meetings varied between 60 and 90 minutes, all data were standardized on a 1-hour period (see Kauffeld & Lehmann-Willenbrock, 2012). To that end, we divided the number of codes per category by the length of the videotape in minutes and then multiplied by 60. In the present study, we calculated percentage values to determine the frequency of specific behaviors within each individual's share of the team meeting to facilitate cluster analysis later in the process. For example, if a participant had contributed a total of 150 statements per meeting (standardized to a 60-minute period) and if 25 of those statements were coded as "problem," the participant would receive a value of 16.7% in the problem category.

Satisfaction with the meeting process

Participants rated their satisfaction with the meeting process with a four-item survey immediately after the meeting. Sample items are "The group discussion has brought about new ideas" and "The group discussion was time well spent for me." Items were rated on a 5-point Likert-type scale (1 = completely disagree; 5 = completely agree). Internal consistency was high (Cronbach's $\alpha = .85$).

Idea longevity

We reasoned that ideas considered to be realistic from the teams' point of view would "live longer" and would be discussed in the workshop following the videotaped meeting. To calculate the longevity of the various ideas generated by each team, we recorded whether and to what extent ideas and solutions developed in the meeting were followed up later during the workshop. That is, we measured whether ideas and solutions generated in the meeting actually made it to follow-up meetings beyond the meeting context. To quantify this, we used a scale ranging from 0 to 1. Values were assigned as follows (see Kauffeld, Jonas, Grote, Frey, & Frieling, 2004): If an idea mentioned in the meeting was not mentioned again later during the workshop, a value of 0 was assigned to it (i.e., no longevity for that particular idea). If an idea from the meeting was only briefly mentioned later during the workshop, a value of 0.2 was assigned to it. If an idea from the meeting was somewhat elaborated during the workshop, a value of 0.4 was assigned. If an idea was elaborated and somewhat linked in the discussion during the workshop (i.e., if some advantages and disadvantages as well as consequences of implementing the idea were mentioned), a value of 0.6 was assigned to it. For thoroughly elaborated and linked ideas, a value of 0.8 was assigned. Finally, if an idea from the meeting was discussed to the point of concrete measures being planned, it was assigned a 1 (i.e., perfect longevity for that particular idea). These different stages were easily identifiable. The overall idea-longevity indicator was calculated as the sum of the thus evaluated ideas. As we were unable to use these measures in some of the workshops, the sample was reduced from 59 to 44 teams for the two outcome measures.

Results

Identifying Emergent Communicative Roles

RQ1 asked about the presence of observable roles in team meeting interactions. In other words, can meeting participants be assigned to different clusters, based on their meeting behavior patterns, in a reliable manner? To explore these potential roles, a hierarchical cluster analysis was performed. The aim in hierarchical cluster analysis is to generate internally homogeneous clusters with substantial differences between clusters. We used this method to identify clusters of people with similar behavioral patterns across all meetings. These clusters or patterns were calculated based on the meeting behaviors of all individuals (in percent of total individual contributions per meeting) across all meetings. After *z*-standardizing our data, we used Ward's (1963) method for cluster analysis and the Euclidean distance as a measure of distance between clusters. As there is no statistical measure to select the number of clusters, we selected the most appropriate solution in terms of interpretability. A solution with five clusters emerged. That is, based on the observed meeting behaviors across all teams and across all meetings, every participant was assigned to one of the five clusters. Table 3 depicts the means and standard deviations for the different meeting behaviors and shows how these meeting behaviors were distributed across the five clusters of participants.

Table 3 Means, Standard Deviations, and Distribution of Communication Aspects (in %) for the Five-Cluster-Solution

	M	*SD*	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Differentiating a problem	8.16	5.22	6.52	8.25	**14.19**	6.11	5.40
Cross-linking a problem	4.33	3.39	3.77	4.30	**7.23**	1.87	5.42
Differentiating a solution	4.80	3.70	3.58	**9.13**	4.22	2.71	4.79
Cross-linking a solution	3.21	2.95	1.92	**6.55**	3.28	1.97	2.75
Statements about the organization	9.89	6.54	11.41	10.43	11.67	5.28	7.31
Knowledge management	3.93	3.52	3.94	5.07	3.45	1.52	**7.32**
Positive procedural statements	5.63	8.28	2.53	5.96	5.83	2.02	**26.18**
Negative procedural statements	3.67	4.43	**6.21**	1.73	3.17	2.70	0.66
Positive socio-emotional statements	18.05	8.55	20.97	18.97	20.01	9.42	16.51
Negative socio-emotional statements	31.10	18.48	27.02	24.19	22.45	**61.87**	21.51
Proactive statements	1.22	1.72	1.12	**2.28**	0.88	0.68	0.84
Counteractive statements	6.01	5.90	**11.01**	3.15	3.63	3.84	1.32

Note. $N = 357$ individuals. All behaviors per 60-minute period. Values printed in bold stand out in comparison with the other clusters, respectively. For example, 14.19% of statements coded as "differentiating a problem" belonged to Cluster 3.

To determine whether the five-cluster solution was stable, a discriminant analysis was performed. Discriminant analyses aim at predicting team membership by a specific predictor (Tabachnik & Fidell, 2006). We wanted to predict inclusion in a specific cluster based on the meeting behavior aspects. The results show that 87.4% of the cases were categorized correctly by the discriminant function, ranging from 83.6% to 91.8% for clusters of correct classification. These values are clearly above the a priori probability of 20%. Thus, statistically, the derived five-cluster solution can be regarded as stable. We then inspected the distribution of act4teams meeting-behavior aspects in order to find qualitative differences between the clusters (see Table 3) and in order to generate labels. The five clusters can be described as follows.

Cluster 1: The complainer

More than 35% of the sample belonged to this cluster. Compared to the other clusters, participants in this cluster had a considerably higher share of negative procedural statements (6.2%) and counteractive statements (11.0%; see Table 2 for meeting behavior aspects). At the observation category level, complaining (5.8%) and criticizing statements (4.4%) stood out. Moreover, the category "losing the train of thought in details and examples" (5.6%) was prominent in this cluster. Thus, this cluster included persons who tend to participate actively in the discussion but hindered the problem-solving process by providing mainly negative remarks. Due to the negative focus, we labeled participants in this cluster complainers.

Cluster 2: The solution seeker

The second cluster amounted to 20.7% of the overall sample. Participants in this cluster were characterized by contributions toward the differentiation of solutions (9.1%), cross-linkage of solutions (6.6%), as well as proactive statements (2.3%). Because of the focus on solution orientation and positive participation, participants in this cluster could be called solution seekers.

Cluster 3: The problem analyst

The third cluster accounted for 18.8% of the overall sample. More than 20% of the contributions of participants in this cluster were problem oriented: Differentiation of problems (14.2%) and cross-linkage of problems (7.2%) were the most characteristic remarks for this cluster. At the observation category level, this was reflected by mentioning problems (5.8%), describing problems (8.5%), and connecting them to other problems (7.2%). Since the percentage of problem-oriented contributions was considerably higher than in the other clusters, participants in this cluster can be described as problem analysts.

Cluster 4: The indifferent

This cluster amounts to 17.1% of the overall sample. This cluster was characterized by a large amount of negative socioemotional contributions (61.9%). A look at the category level reveals that this was due to side conversations (56.3%). Persons in this cluster tended to get involved in individual discussions with others rather than actively participating in the team meeting. We called this cluster the indifferent because these participants seemed to provide no relevant contribution to the team meeting.

Cluster 5: The procedural facilitator

This was the smallest cluster in our study, accounting for 7.8% of the overall sample. The main characteristics of this cluster were statements concerning knowledge management (7.3%) and positive structuring remarks (26.2%). At the category level, especially the amount of visualizing (9.3%), procedural suggestions (5.7%), procedural questions (2.9%), and questions on the topic (7.3%), as well as clarifying (3.2%) and summarizing (1.5%) were higher than in the other clusters. As these behaviors are aimed at structuring the discussion, we labeled this cluster the procedural facilitator.

Emergent Roles and Meeting Satisfaction

RQ2 asked about links between the occurrence of specific roles and participants' satisfaction with the meeting process. Pearson's correlation coefficients were calculated between the number of roles present in each team and the evaluation of meeting satisfaction (participant survey), as shown in Table 4. We then calculated *t* tests to compare the meeting satisfaction of teams including a specific discussion role with those of teams without that particular role. We found a significant negative effect of complainers: Teams where this discussion role was present reported significantly

Table 4 Pearson's Correlations Between the Extent to Which Specific Roles Were Present in a Team and the Outcome Variables (Meeting Satisfaction and Idea Longevity)

			Satisfaction with the meeting process	Idea longevity
	M	*SD*	*r*	*r*
Complainer	0.37	0.34	–.54**	–.57**
Solution seeker	0.18	0.22	.31*	.53**
Problem analyst	0.18	0.23	.24	.28^{+}
Indifferent	0.18	0.19	.148	.07
Procedural facilitator	0.08	0.19	.16	–.01

Note. $N = 44$ teams. Two-tailed Pearson's correlations calculated at the team level between the amount of each cluster present in each team and the two outcome measures. The correlation between meeting satisfaction and idea longevity was $r = .50$ ($p < .01$).
**$p < .01$. *$p < .05$. $^{+}p < .10$.

Table 5 *t*-Tests Comparing Meeting Process Satisfaction for Teams With Versus Without Specific Roles Present

	Satisfaction with the meeting process							
	Cluster present in the team (yes/no)	*N*	*M*	*SD*	*df*	*t*	Cohen's *d*	Effect size *r*
Complainer	Y	30	4.23	0.75	42	–2.06*	0.64	.30
	N	14	4.70	0.61				
Solution seeker	Y	23	4.51	0.12	42	1.27	0.39	.19
	N	21	4.23	0.19				
Problem analyst	Y	23	4.56	0.63	42	1.79+	0.55	.27
	N	21	4.17	0.80				
Indifferent	Y	28	4.50	0.65	42	1.55	0.48	.23
	N	16	4.15	0.84				
Procedural facilitator	Y	11	4.73	0.58	42	1.93+	0.60	.29
	N	33	4.26	0.75				

*$p < .05$. +$p < .10$.

lower satisfaction with the meeting process, $t = -2.06$, $p < .05$; Cohen's $d = 0.64$; effect size $r = .30$ (see Table 5). Marginally positive effects were found for problem analysts and procedural facilitators and satisfaction ($p < .10$, respectively; see Table 5). Indifferent participants and solution seekers had no significant effect on meeting satisfaction.

Emergent Communicative Roles and Idea Longevity

RQ3 asked about the linkages between emergent roles and idea longevity. The correlational results (see Table 4) highlighted the "solution seeker" and the "complainer" clusters. For solution seekers, the correlation was $r = .53$ ($p < .01$). That is, the extent to which the solution seeker cluster was present in a team meeting was positively linked to solution longevity. We also found a marginally significant positive correlation between the amount of the problem analyst cluster and the team's idea longevity ($r = .28$, $p < .10$). On the other hand, the correlation between the amount of complainer presence in a team meeting and the idea longevity indicator was significantly negative ($r = -.57$; $p < .01$). For the other roles, there were no significant correlations (see Table 4).

The *t* tests showed significant effects of solution seekers and complainers on idea longevity beyond the meetings. Teams containing a complainer had significantly lower idea-longevity scores than teams without a complainer, $t = 2.47$, $p < .05$; Cohen's $d = 1.13$; effect size $r = .49$ (see Table 6). The reverse was true concerning the solution seeker: Teams with a solution seeker showed

Table 6 *t*-Tests Comparing Idea Longevity for Teams With Versus Without Specific Roles Present

	Idea-longevity index							
	Cluster present in the team (yes/no)	*N*	*M*	*SD*	*df*	*t*	Cohen's *d*	Effect size *r*
Complainer	Y	30	0.95	1.01	19	2.47*	1.13	.49
	N	14	2.04	1.51				
Solution seeker	Y	23	1.80	1.39	38	–3.02**	0.98	.44
	N	21	0.75	0.89				
Problem analyst	Y	23	1.46	1.30	42	–0.88	0.27	.13
	N	21	1.12	1.27				
Indifferent	Y	28	1.43	1.28	42	–0.91	0.28	.14
	N	16	1.06	1.28				
Procedural facilitator	Y	11	1.49	0.88	28	–0.72	0.27	.13
	N	33	1.23	1.39				

**$p < .01$. *$p < .05$.

significantly higher idea-longevity scores than teams without this discussion role, $t = -3.02$, $p < .01$; Cohen's $d = 0.98$; effect size $r = .44$. After a Holm correction, these differences remained significant. For all other roles, no significant differences occurred (see Table 6).

Discussion

This study investigated emergent team roles, in terms of team members' observable communicative patterns and their impact on team outcomes. Three conclusions are warranted from these results. First, five different team roles were communicatively enacted in the team meeting interactions observed, which we labeled, based on their behavioral characteristics exhibited in the meeting, as complainers, solution seekers, problem analysts, procedural facilitators, and the indifferent. Second, two of these roles—complainers and solution seekers—affected the longevity of ideas developed by the teams. Having a complainer in the meeting tended to result in lower longevity ideas, whereas having a solution seeker present in the meeting tended to yield higher longevity ideas. Given that the complainer cluster represented the largest group of participants, this finding appears problematic for team functioning. Last, teams with complainers also indicated lower levels of process satisfaction.

Our results show that team roles do exist in problem-solving teams, and that these roles can be identified based on their communication. As such, our study positions communication at the center of team functioning. In general, this approach aligns with recent developments in the area of organization theory and institutional theory

(Cornelissen, Durand, Fiss, Lammers, & Vaara, 2015; Gray, Purdy, & Ansari, 2015). Specifically, our focus on the communicative acts of team members in order to identify team roles advances the field of communication in two key ways.

First, our study speaks to the central premise that team roles are emergent through interaction (e.g., Belbin, 2010). By conceptualizing the foundation of team member roles as a pattern of communicative acts, we place interaction at the very core of team functioning (e.g., Kauffeld & Lehmann-Willenbrock, 2012). Importantly, and in contrast to past research on team roles, we also problematize instead of assume communication and communication influence (Burleson, 1992).

Second, our findings speak to the idea that team role differentiation primarily occurs through interaction among team members (Hare, 1994; Salazar, 1996). Our results suggest the informal structure and role differentiation created in these teams were based on team member interaction. Interaction behaviors are "visible" to other group members, allowing members to claim influence and roles amidst the gaze of others. Member can form impressions and reinforce specific behaviors within the team communication flow (Beebe & Masterson, 2003). In other words, team interaction becomes the medium for communicative negotiation of team roles.

Previous team role taxonomies assessed roles by self-ratings or self-descriptions and less often by peer ratings or observer assessments. Prior studies also tended to focus on positive, functional team roles as opposed to using communicative coding schemes that captured the nuance of all team interaction and team roles. We used natural team communicative data to identify roles, and we believe that this methodological practice holds promise. If team roles are constituted in interaction (Beebe & Masterson, 2003; Poole et al., 1985), then the preferable method for discovering team member roles is through direct observation of their communication. We followed this line of reasoning by using natural teams to obtain objective communicative behavioral data.

Moreover, we found hints that the presence or absence of certain roles can facilitate or hinder the team interaction and problem-solving process. These results show some similarities to existing team role taxonomies. The helpful communicative roles we identified, namely procedural facilitators, solution seekers, and problem analysts, can be found in other taxonomies by different names (cf. Belbin, 1981, 2010). However, the complainer and the indifferent appear to be unique to the present study. These findings challenge those taxonomies that do not include dysfunctional team roles.

It was interesting to discover both positive and negative linkages between team roles and meeting outcomes. We found that complainers affected the outcomes of the team meetings negatively, while solution seekers (at least in terms of idea longevity) were facilitative. Unlike some past research, these results suggest that not all roles are equally helpful for reaching team goals. Thus, a team including all roles (e.g., Belbin's, 1981, 2010) may not be the best model. Rather, it may be more important to ensure the inclusion of a solution seeker and the exclusion of complainers to improve meeting processes.

However, we argue that complainers may still serve a useful function in shaping team outcomes. Perhaps contributions by the complainer can help the team to discern which ideas to ignore or discard. The complainer may bring up problems that trigger ideas for change or may serve as a conflict instigator that prompts more in-depth deliberation on an issue than if the team was homogenously positive. Leaders may use the complainer to strengthen his or her control over the group (Garner & Poole, 2009). Although our findings showed an inverse relationship between these roles and team outcomes, perhaps the beneficial influence of these roles may be seen elsewhere. Future research should look at the content of these participants' communication to better understand their role in teams' problem-solving processes.

A closer look at our results shows that the presence of certain team roles had no significant effect on team outcomes. It is not particularly surprising that the indifferent did not provide substantial contributions to the team meeting. However, the finding that the problem analyst and the procedural facilitator did marginally influence satisfaction but did not impact idea longevity is intriguing. Since these findings were only marginally significant, we wish to speak about them in terms of future research, as opposed to making any overextended claims. Of course, there is the possibility that our outcome measures were not suitable to the specific type of beneficial influence generated by these roles. Since the teams in our sample were primarily seeking solutions to problems, it may be that they concentrated most of their interactive time on that activity. Hence, there may be a smaller number of problem-focused and procedural statements in the discussions, resulting in less impact of these roles on final outcomes. Future research might look more closely at the ratio of the different kinds of statements in these meetings to determine if team members focused disproportionately on solutions and complaining. Additionally, the solution seeker had an opposite finding as compared to these two roles, in that there was an association with idea longevity but not meeting satisfaction. Perhaps the focus of solution seekers on the bottom line prevents much of an influence on the social fabric of the team.

Limitations

Our study provides an initial glimpse of emergent team roles in organizational meetings. However, this study is not without limitations. First, our study was exploratory in design, and more research is warranted to confirm our team roles with other samples. Second, our research setting is limited to a specific meeting situation. For example, the presence of a formal team leader could have an impact on the team roles that emerge. Third, our sample consisted primarily of male team members. Previous research has shown some gender differences regarding team roles (Balderson & Broderick, 1996). However, when we compared the gender distribution of team roles in post hoc analyses, our results showed that the team roles of female and male team members were not significantly different, $\chi^2(4, n = 356) = 4.24$, $p > .05$. Fourth, the idea-longevity measure is an original and novel approach to investigating the influence of meeting roles on team outcomes, but further exploration is needed to know exactly how or why these roles influence the

life of an idea. Future research is also needed in order to validate the measure of idea longevity that was introduced in this study. Moreover, in some circumstances, idea longevity may not be a desirable outcome, given the quality of discussion. However, the data from this study suggest that solution seekers lead to more idea longevity and complainers lead to less, while idea longevity and satisfaction with meeting process are moderately correlated ($r = .50$, $p < .01$).

Implications and Directions for Future Research

An important task for future research will be to investigate the stability of the team roles identified in this study. For example, it is possible that long-term membership in continuous teams might lead to stable team roles over time. In addition, it would be interesting to investigate whether the interactive climate in the team engenders production of certain team roles. Previous research shows that interactive circles emerge in work teams (Kauffeld & Meyers, 2009; Lehmann-Willenbrock et al., 2011). A complaint is typically followed by a supportive statement and then by another complaint. Conversely, a solution-oriented statement tends to be followed by a supportive statement and then another solution-oriented statement. Hence, specific team roles such as the complainer or the solution seeker may develop only when the interactive climate in the team is supportive of this role. We may want to rethink team roles as group rather than individual creations. That is, they would emerge in and be sustained through the interaction of the whole team rather than being produced by individual team members. As a practical implication of this idea, teams should be aware that they share responsibility for their interaction processes and outcomes. One way to achieve this awareness is by means of perspective taking, which can aid mutual understanding and can prevent individual team members from becoming stigmatized as "complainers" (cf. Galinsky, Ku, & Wang, 2005).

The present study also suggests several managerial implications. Importantly, managers must pay special attention to complainers in meetings. The influence of complainers is twofold: They behave in a way that labels them with a negative role, and their complaining behavior can lead to patterns at the interaction level with other members (e.g., Kauffeld & Meyers, 2009). Thus, the influence of one complainer can influence the communication behaviors of other meeting participants due to the interdependent nature of group discussion (Beck & Keyton, 2011). In this light, managers would be well advised to proactively deal with complaints before they contaminate the meeting discussion. It may also be plausible for leaders to develop a plan that would use the complainers' negative behavior to their advantage (e.g., Garner & Poole, 2009).

Conclusion

This study puts communication at the core of team functioning and shows how team roles are shaped by team communication processes. The results of this investigation

point to a set of team roles that emerge in and are constituted by communication processes in teams. These team roles can be both facilitative and inhibitive in influencing team outcomes. The five team roles identified in this study show some resemblance to team roles identified in past taxonomies, but the similarities are not complete. For example, the complainer and the indifferent, identified in the present study, do not seem to have counterparts in previous team role taxonomies.

This study represents an important first step in conceptualizing team roles as dynamically emerging in interaction, rather than as individual input factors (i.e., individual positions, functions, styles, expectations, or preferences for a specific role in the team). Understanding team roles as constituted in, and through, communicative behavior provides an opportunity to rethink team roles as processual, fluid, and creative properties of the team rather than the individual alone. Furthermore, these findings challenge us to think about how individual input factors and team interaction processes work together to produce roles that may (or may not) be stable across teams, individuals, tasks, and time.

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Note

[1] Meetings are rarely attended by all team members. According to the bona fide group perspective (Stohl & Putnam, 1994), permeable boundaries are an important characteristic of natural teams. Thus, this selection procedure was not considered to be an obstacle to the study.

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